

SEQUENCE LISTING

<110> Minerva Biotechnologies Corporation

<120> Techniques and Compositions for the Diagnosis and Treatment of Cancer (MUC1)

<130> M1015.70089W000

<140> not yet assigned

<141> 2004-08-26

<150> US 60/498,260

<151> 2003-08-26

<160> 66

<170> PatentIn version 3.3

<210> 1

<211> 39

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 1

Gly Thr Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys
1 5 10 15

Thr Glu Ala Ala Ser Pro Tyr Asn Leu Thr Ile Ser Asp Val Ser Val
20 25 30

Ser His His His His His His
35

<210> 2

<211> 51

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 2

Gly Thr Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys
1 5 10 15

Thr Glu Ala Ala Ser Pro Tyr Asn Leu Thr Ile Ser Asp Val Ser Val
20 25 30

Ser Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala His His His
35 40 45

His His His
50

<210> 3
<211> 54
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 3

Val Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile Asn Val His Asp
1 5 10 15

Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr Glu Ala Ala Ser Pro Tyr
20 25 30

Asn Leu Thr Ile Ser Asp Val Ser Val Ser Asp Val Pro Phe Pro Phe
35 40 45

His His His His His His
50

<210> 4
<211> 31
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 4

His His His His His His Gly Phe Leu Gly Leu Ser Asn Ile Lys Phe
1 5 10 15

Arg Pro Gly Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu
20 25 30

<210> 5
<211> 46
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 5

Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly
1 5 10 15

Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro
 20 25 30
 Pro Ala His Gly Val Thr Ser Ala His His His His His His
 35 40 45

<210> 6
 <211> 33
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 6

Gly Thr Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys
 1 5 10 15
 Thr Glu Ala Ala Ser Pro Tyr Asn Leu Thr Ile Ser Asp Val Ser Val
 20 25 30

Ser

<210> 7
 <211> 45
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 7

Gly Thr Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys
 1 5 10 15
 Thr Glu Ala Ala Ser Pro Tyr Asn Leu Thr Ile Ser Asp Val Ser Val
 20 25 30
 Ser Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala
 35 40 45

<210> 8
 <211> 25
 <212> PRT
 <213> Homo sapiens

<400> 8

Gly Phe Leu Gly Leu Ser Asn Ile Lys Phe Arg Pro Gly Ser Val Val
 1 5 10 15
 Val Gln Leu Thr Leu Ala Phe Arg Glu
 20 25

<210> 9
 <211> 40
 <212> PRT
 <213> Homo sapiens

<400> 9

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Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly
1          5          10          15
Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro
          20          25          30
Pro Ala His Gly Val Thr Ser Ala
          35          40

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<210> 10
 <211> 1255
 <212> PRT
 <213> Homo sapiens

<400> 10

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Met Thr Pro Gly Thr Gln Ser Pro Phe Phe Leu Leu Leu Leu Thr
1          5          10          15
Val Leu Thr Val Val Thr Gly Ser Gly His Ala Ser Ser Thr Pro Gly
          20          25          30
Gly Glu Lys Glu Thr Ser Ala Thr Gln Arg Ser Ser Val Pro Ser Ser
          35          40          45
Thr Glu Lys Asn Ala Val Ser Met Thr Ser Ser Val Leu Ser Ser His
          50          55          60
Ser Pro Gly Ser Gly Ser Ser Thr Thr Gln Gly Gln Asp Val Thr Leu
65          70          75          80
Ala Pro Ala Thr Glu Pro Ala Ser Gly Ser Ala Ala Thr Trp Gly Gln
          85          90          95
Asp Val Thr Ser Val Pro Val Thr Arg Pro Ala Leu Gly Ser Thr Thr
          100          105          110
Pro Pro Ala His Asp Val Thr Ser Ala Pro Asp Asn Lys Pro Ala Pro
          115          120          125
Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
          130          135          140
Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
145          150          155          160
Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
          165          170          175
Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
          180          185          190

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Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
 195 200 205
 Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
 210 215 220
 Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
 225 230 235 240
 Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
 245 250 255
 Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
 260 265 270
 Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
 275 280 285
 Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
 290 295 300
 Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
 305 310 315 320
 Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
 325 330 335
 Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
 340 345 350
 Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
 355 360 365
 Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
 370 375 380
 Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
 385 390 395 400
 Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
 405 410 415
 Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
 420 425 430
 Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
 435 440 445
 Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
 450 455 460
 Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
 465 470 475 480
 Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
 485 490 495
 Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
 500 505 510

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
 515 520 525
 Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
 530 535 540
 Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
 545 550 555 560
 Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
 565 570 575
 Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
 580 585 590
 Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
 595 600 605
 Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
 610 615 620
 Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
 625 630 635 640
 Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
 645 650 655
 Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
 660 665 670
 Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
 675 680 685
 Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
 690 695 700
 Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
 705 710 715 720
 Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
 725 730 735
 Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
 740 745 750
 Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
 755 760 765
 Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
 770 775 780
 Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
 785 790 795 800
 Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
 805 810 815
 Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
 820 825 830

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
 835 840 845
 Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
 850 855 860
 Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
 865 870 875 880
 Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
 885 890 895
 Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
 900 905 910
 Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
 915 920 925
 Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Asn
 930 935 940
 Arg Pro Ala Leu Gly Ser Thr Ala Pro Pro Val His Asn Val Thr Ser
 945 950 955 960
 Ala Ser Gly Ser Ala Ser Gly Ser Ala Ser Thr Leu Val His Asn Gly
 965 970 975
 Thr Ser Ala Arg Ala Thr Thr Thr Pro Ala Ser Lys Ser Thr Pro Phe
 980 985 990
 Ser Ile Pro Ser His His Ser Asp Thr Pro Thr Thr Leu Ala Ser His
 995 1000 1005
 Ser Thr Lys Thr Asp Ala Ser Ser Thr His His Ser Ser Val Pro
 1010 1015 1020
 Pro Leu Thr Ser Ser Asn His Ser Thr Ser Pro Gln Leu Ser Thr
 1025 1030 1035
 Gly Val Ser Phe Phe Phe Leu Ser Phe His Ile Ser Asn Leu Gln
 1040 1045 1050
 Phe Asn Ser Ser Leu Glu Asp Pro Ser Thr Asp Tyr Tyr Gln Glu
 1055 1060 1065
 Leu Gln Arg Asp Ile Ser Glu Met Phe Leu Gln Ile Tyr Lys Gln
 1070 1075 1080
 Gly Gly Phe Leu Gly Leu Ser Asn Ile Lys Phe Arg Pro Gly Ser
 1085 1090 1095
 Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile Asn
 1100 1105 1110
 Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr Glu Ala
 1115 1120 1125
 Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser Val Ser Asp
 1130 1135 1140

Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala Gly Val Pro Gly
 1145 1150 1155

Trp Gly Ile Ala Leu Leu Val Leu Val Cys Val Leu Val Ala Leu
 1160 1165 1170

Ala Ile Val Tyr Leu Ile Ala Leu Ala Val Cys Gln Cys Arg Arg
 1175 1180 1185

Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp Thr Tyr
 1190 1195 1200

His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg Tyr
 1205 1210 1215

Val Pro Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys Val Ser
 1220 1225 1230

Ala Gly Asn Gly Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala Val
 1235 1240 1245

Ala Ala Ala Ser Ala Asn Leu
 1250 1255

<210> 11
 <211> 302
 <212> PRT
 <213> Homo sapiens

<400> 11

Ala Ala Ala Lys Glu Gly Lys Lys Ser Arg Asp Arg Glu Arg Pro Pro
 1 5 10 15

Ser Val Pro Ala Leu Arg Glu Gln Pro Pro Glu Thr Glu Pro Gln Pro
 20 25 30

Ala Trp Lys Met Pro Arg Ser Cys Cys Ser Arg Ser Gly Ala Leu Leu
 35 40 45

Leu Ala Leu Leu Leu Gln Ala Ser Met Glu Val Arg Gly Trp Cys Leu
 50 55 60

Glu Ser Ser Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Glu
 65 70 75 80

Cys Ile Arg Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Met Phe
 85 90 95

Pro Gly Asn Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr
 100 105 110

Val Met Gly His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Ser Ser
 115 120 125

Ser Ser Gly Ser Ser Gly Ala Gly Gln Lys Arg Glu Asp Val Ser Ala
 130 135 140

Gly Glu Asp Cys Gly Pro Leu Pro Glu Gly Gly Pro Glu Pro Arg Ser
 145 150 155 160

Asp Gly Ala Lys Pro Gly Pro Arg Glu Gly Lys Arg Ser Tyr Ser Met
 165 170 175
 Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val
 180 185 190
 Lys Val Tyr Pro Asn Gly Ala Glu Asp Glu Ser Ala Glu Ala Phe Pro
 195 200 205
 Leu Glu Phe Lys Arg Glu Leu Thr Gly Gln Arg Leu Arg Glu Gly Asp
 210 215 220
 Gly Pro Asp Gly Pro Ala Asp Asp Gly Ala Gly Ala Gln Ala Asp Leu
 225 230 235 240
 Glu His Ser Leu Leu Val Ala Ala Glu Lys Lys Asp Glu Gly Pro Tyr
 245 250 255
 Arg Met Glu His Phe Arg Trp Gly Ser Pro Pro Lys Asp Lys Arg Tyr
 260 265 270
 Gly Gly Phe Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val Thr Leu
 275 280 285
 Phe Lys Asn Ala Ile Ile Lys Asn Ala Tyr Lys Lys Gly Glu
 290 295 300

<210> 12
 <211> 31
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 12

His His His His His His Ser Ser Ser Ser Gly Ser Ser Ser Ser Gly
 1 5 10 15
 Ser Ser Ser Ser Gly Gly Arg Gly Asp Ser Gly Arg Gly Asp Ser
 20 25 30

<210> 13
 <211> 19
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 13

His His His His His His Arg Gly Glu Phe Thr Gly Thr Tyr Ile Thr
 1 5 10 15

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Ala Val Thr

<210> 14
<211> 12
<212> PRT
<213> Homo sapiens

<400> 14

Thr Phe Ile Ala Ile Lys Pro Asp Gly Val Gln Arg
1 5 10

<210> 15
<211> 18
<212> PRT
<213> Homo sapiens

<220>
<221> misc_feature
<222> (3)..(3)
<223> Xaa can be any naturally occurring amino acid

<400> 15

Val Met Xaa Leu Gly Glu Thr Asn Pro Ala Asp Ser Lys Pro Gly Thr
1 5 10 15

Ile Arg

<210> 16
<211> 17
<212> PRT
<213> Homo sapiens

<400> 16

Val Met Leu Gly Glu Thr Asn Pro Ala Asp Ser Lys Pro Gly Thr Ile
1 5 10 15

Arg

<210> 17
<211> 10
<212> PRT
<213> Homo sapiens

<400> 17

Asn Ile Ile His Gly Ser Asp Ser Val Lys
1 5 10

11/32

<210> 18
<211> 9
<212> PRT
<213> Homo sapiens

<400> 18

Gly Leu Val Gly Glu Ile Ile Lys Arg
1 5

<210> 19
<211> 8
<212> PRT
<213> Homo sapiens

<400> 19

Gly Leu Val Gly Glu Ile Ile Lys
1 5

<210> 20
<211> 21
<212> PRT
<213> Homo sapiens

<220>
<221> misc_feature
<222> (3)..(3)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (12)..(12)
<223> Xaa can be any naturally occurring amino acid

<400> 20

Tyr Met Xaa His Ser Gly Pro Val Val Ala Met Xaa Val Trp Glu Gly
1 5 10 15

Leu Asn Val Val Lys
20

<210> 21
<211> 19
<212> PRT
<213> Homo sapiens

<400> 21

Ala Ala Phe Asp Asp Ala Ile Ala Glu Leu Asp Thr Leu Ser Glu Glu
1 5 10 15

Ser Tyr Lys

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<210> 22
<211> 18
<212> PRT
<213> Homo sapiens

<220>
<221> misc_feature
<222> (8)..(8)
<223> Xaa can be any naturally occurring amino acid

<400> 22

Ala Ala Ser Asp Ile Ala Met Xaa Thr Glu Leu Pro Pro Thr His Pro
1 5 10 15

Ile Arg

<210> 23
<211> 11
<212> PRT
<213> Homo sapiens

<400> 23

Tyr Leu Ala Glu Phe Ala Thr Gly Asn Asp Arg
1 5 10

<210> 24
<211> 10
<212> PRT
<213> Homo sapiens

<400> 24

Asp Ser Thr Leu Ile Met Gln Leu Leu Arg
1 5 10

<210> 25
<211> 9
<212> PRT
<213> Homo sapiens

<400> 25

Tyr Asp Glu Met Val Glu Ser Met Lys
1 5

<210> 26
<211> 14
<212> PRT
<213> Homo sapiens

<220>
<221> misc_feature

<222> (5)..(5)

<223> Xaa can be any naturally occurring amino acid

<400> 26

Val Ala Gly Met Xaa Asp Val Glu Leu Thr Val Glu Glu Arg
1 5 10

<210> 27

<211> 12

<212> PRT

<213> Homo sapiens

<400> 27

His Leu Ile Pro Ala Ala Asn Thr Gly Glu Ser Lys
1 5 10

<210> 28

<211> 19

<212> PRT

<213> Homo sapiens

<220>

<221> misc_feature

<222> (12)..(12)

<223> Xaa can be any naturally occurring amino acid

<400> 28

Asp Pro Asp Ala Gln Pro Gly Gly Glu Leu Met Xaa Leu Gly Gly Thr
1 5 10 15

Asp Ser Lys

<210> 29

<211> 18

<212> PRT

<213> Homo sapiens

<400> 29

Asp Pro Asp Ala Gln Pro Gly Gly Glu Leu Met Leu Gly Gly Thr Asp
1 5 10 15

Ser Lys

<210> 30

<211> 18

<212> PRT

<213> Homo sapiens

<220>

<221> misc_feature

<222> (15)..(15)

<223> Xaa can be any naturally occurring amino acid

<400> 30

Ile Ser Val Asn Asn Val Leu Pro Val Phe Asp Asn Leu Met Xaa Gln
1 5 10 15

Gln Lys

<210> 31

<211> 17

<212> PRT

<213> Homo sapiens

<400> 31

Ile Ser Val Asn Asn Val Leu Pro Val Phe Asp Asn Leu Met Gln Gln
1 5 10 15

Lys

<210> 32

<211> 10

<212> PRT

<213> Homo sapiens

<400> 32

Gln Pro Gly Ile Thr Phe Ile Ala Ala Lys
1 5 10

<210> 33

<211> 16

<212> PRT

<213> Homo sapiens

<400> 33

Gly Leu Gly Thr Asp Glu Glu Ser Ile Leu Thr Leu Leu Thr Ser Arg
1 5 10 15

<210> 34

<211> 13

<212> PRT

<213> Homo sapiens

<400> 34

Asp Leu Leu Asp Asp Leu Lys Ser Glu Leu Thr Gly Lys
1 5 10

<210> 35

<211> 9

<212> PRT

<213> Homo sapiens

<400> 35

Ser Glu Ile Asp Leu Phe Asn Ile Arg
 1 5

<210> 36

<211> 45

<212> PRT

<213> Homo sapiens

<400> 36

Gly Thr Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys
 1 5 10 15

Thr Glu Ala Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser Val
 20 25 30

Ser Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala
 35 40 45

<210> 37

<211> 146

<212> PRT

<213> Homo sapiens

<400> 37

Gly Thr Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys
 1 5 10 15

Thr Glu Ala Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser Val
 20 25 30

Ser Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala Gly Val Pro
 35 40 45

Gly Trp Gly Ile Ala Leu Leu Val Leu Val Cys Val Leu Val Ala Leu
 50 55 60

Ala Ile Val Tyr Leu Ile Ala Leu Ala Val Cys Gln Cys Arg Arg Lys
 65 70 75 80

Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp Thr Tyr His Pro
 85 90 95

Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg Tyr Val Pro Pro
 100 105 110

Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys Val Ser Ala Gly Asn Gly
 115 120 125

Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala Val Ala Ala Ala Ser Ala
 130 135 140

Asn Leu
 145

<210> 38
 <211> 171
 <212> PRT
 <213> Homo sapiens

<400> 38

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Gly Phe Leu Gly Leu Ser Asn Ile Lys Phe Arg Pro Gly Ser Val Val
1      5      10      15
Val Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile Asn Val His Asp
20      25      30
Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr Glu Ala Ala Ser Arg Tyr
35      40      45
Asn Leu Thr Ile Ser Asp Val Ser Val Ser Asp Val Pro Phe Pro Phe
50      55      60
Ser Ala Gln Ser Gly Ala Gly Val Pro Gly Trp Gly Ile Ala Leu Leu
65      70      75      80
Val Leu Val Cys Val Leu Val Ala Leu Ala Ile Val Tyr Leu Ile Ala
85      90      95
Leu Ala Val Cys Gln Cys Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile
100     105     110
Phe Pro Ala Arg Asp Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr
115     120     125
His Thr His Gly Arg Tyr Val Pro Pro Ser Ser Thr Asp Arg Ser Pro
130     135     140
Tyr Glu Lys Val Ser Ala Gly Asn Gly Gly Ser Ser Leu Ser Tyr Thr
145     150     155     160
Asn Pro Ala Val Ala Ala Ala Ser Ala Asn Leu
165     170

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<210> 39
 <211> 275
 <212> PRT
 <213> Homo sapiens

<400> 39

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Ala Thr Thr Thr Pro Ala Ser Lys Ser Thr Pro Phe Ser Ile Pro Ser
1      5      10      15
His His Ser Asp Thr Pro Thr Thr Leu Ala Ser His Ser Thr Lys Thr
20      25      30
Asp Ala Ser Ser Thr His His Ser Thr Val Pro Pro Leu Thr Ser Ser
35      40      45
Asn His Ser Thr Ser Pro Gln Leu Ser Thr Gly Val Ser Phe Phe Phe
50      55      60

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Leu Ser Phe His Ile Ser Asn Leu Gln Phe Asn Ser Ser Leu Glu Asp
 65 70 75 80
 Pro Ser Thr Asp Tyr Tyr Gln Glu Leu Gln Arg Asp Ile Ser Glu Met
 85 90 95
 Phe Leu Gln Ile Tyr Lys Gln Gly Gly Phe Leu Gly Leu Ser Asn Ile
 100 105 110
 Lys Phe Arg Pro Gly Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg
 115 120 125
 Glu Gly Thr Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr
 130 135 140
 Lys Thr Glu Ala Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser
 145 150 155 160
 Val Ser Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala Gly Val
 165 170 175
 Pro Gly Trp Gly Ile Ala Leu Leu Val Leu Val Cys Val Leu Val Ala
 180 185 190
 Leu Ala Ile Val Tyr Leu Ile Ala Leu Ala Val Cys Gln Cys Arg Arg
 195 200 205
 Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp Thr Tyr His
 210 215 220
 Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg Tyr Val Pro
 225 230 235 240
 Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys Val Ser Ala Gly Asn
 245 250 255
 Gly Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala Val Ala Ala Ala Ser
 260 265 270
 Ala Asn Leu
 275

<210> 40
 <211> 233
 <212> PRT
 <213> Homo sapiens

<400> 40

Gly Ser Gly His Ala Ser Ser Thr Pro Gly Gly Glu Lys Glu Thr Ser
 1 5 10 15
 Ala Thr Gln Arg Ser Ser Val Pro Ser Ser Thr Glu Lys Asn Ala Phe
 20 25 30
 Asn Ser Ser Leu Glu Asp Pro Ser Thr Asp Tyr Tyr Gln Glu Leu Gln
 35 40 45

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Arg Asp Ile Ser Glu Met Phe Leu Gln Ile Tyr Lys Gln Gly Gly Phe
 50 55 60
 Leu Gly Leu Ser Asn Ile Lys Phe Arg Pro Gly Ser Val Val Val Gln
 65 70 75 80
 Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile Asn Val His Asp Met Glu
 85 90 95
 Thr Gln Phe Asn Gln Tyr Lys Thr Glu Ala Ala Ser Arg Tyr Asn Leu
 100 105 110
 Thr Ile Ser Asp Val Ser Val Ser Asp Val Pro Phe Pro Phe Ser Ala
 115 120 125
 Gln Ser Gly Ala Gly Val Pro Gly Trp Gly Ile Ala Leu Leu Val Leu
 130 135 140
 Val Cys Val Leu Val Ala Leu Ala Ile Val Tyr Leu Ile Ala Leu Ala
 145 150 155 160
 Val Cys Gln Cys Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro
 165 170 175
 Ala Arg Asp Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr
 180 185 190
 His Gly Arg Tyr Val Pro Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu
 195 200 205
 Lys Val Ser Ala Gly Asn Gly Gly Ser Ser Leu Ser Tyr Thr Asn Pro
 210 215 220
 Ala Val Ala Ala Thr Ser Ala Asn Leu
 225 230

<210> 41
 <211> 863
 <212> PRT
 <213> Homo sapiens

<400> 41

Leu Asp Pro Arg Val Arg Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
 1 5 10 15
 Gly Ser Thr Ala Pro Gln Ala His Gly Val Thr Ser Ala Pro Asp Thr
 20 25 30
 Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
 35 40 45
 Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
 50 55 60
 Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
 65 70 75 80
 Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
 85 90 95

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
100 105 110

Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
115 120 125

Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
130 135 140

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
145 150 155 160

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
165 170 175

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
180 185 190

Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
195 200 205

Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
210 215 220

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
225 230 235 240

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
245 250 255

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
260 265 270

Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
275 280 285

Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
290 295 300

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
305 310 315 320

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
325 330 335

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
340 345 350

Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
355 360 365

Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
370 375 380

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
385 390 395 400

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
405 410 415

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
 420 425 430
 Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
 435 440 445
 Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
 450 455 460
 Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
 465 470 475 480
 Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
 485 490 495
 Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
 500 505 510
 Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
 515 520 525
 Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
 530 535 540
 Gly Val Thr Ser Ala Pro Asp Asn Arg Pro Ala Leu Gly Ser Thr Ala
 545 550 555 560
 Pro Pro Val His Asn Val Thr Ser Ala Ser Gly Ser Ala Ser Gly Ser
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 Ala Ser Thr Leu Val His Asn Gly Thr Ser Ala Arg Ala Thr Thr Thr
 580 585 590
 Pro Ala Ser Lys Ser Thr Pro Phe Ser Ile Pro Ser His His Ser Asp
 595 600 605
 Thr Pro Thr Thr Leu Ala Ser His Ser Thr Lys Thr Asp Ala Ser Ser
 610 615 620
 Thr His His Ser Ser Val Pro Pro Leu Thr Ser Ser Asn His Ser Thr
 625 630 635 640
 Ser Pro Gln Leu Ser Thr Gly Val Ser Phe Phe Phe Leu Ser Phe His
 645 650 655
 Ile Ser Asn Leu Gln Phe Asn Ser Ser Leu Glu Asp Pro Ser Thr Asp
 660 665 670
 Tyr Tyr Gln Glu Leu Gln Arg Asp Ile Ser Glu Met Phe Leu Gln Ile
 675 680 685
 Tyr Lys Gln Gly Gly Phe Leu Gly Leu Ser Asn Ile Lys Phe Arg Pro
 690 695 700
 Gly Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile
 705 710 715 720
 Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr Glu Ala
 725 730 735

Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser Val Ser Asp Val
 740 745 750

Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala Gly Val Pro Gly Trp Gly
 755 760 765

Ile Ala Leu Leu Val Leu Val Cys Val Leu Val Ala Leu Ala Ile Val
 770 775 780

Tyr Leu Ile Ala Leu Ala Val Cys Gln Cys Arg Arg Lys Asn Tyr Gly
 785 790 795 800

Gln Leu Asp Ile Phe Pro Ala Arg Asp Thr Tyr His Pro Met Ser Glu
 805 810 815

Tyr Pro Thr Tyr His Thr His Gly Arg Tyr Val Pro Pro Ser Ser Thr
 820 825 830

Asp Arg Ser Pro Tyr Glu Lys Val Ser Ala Gly Asn Gly Gly Ser Ser
 835 840 845

Leu Ser Tyr Thr Asn Pro Ala Val Ala Ala Ala Ser Ala Asn Leu
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 <212> DNA
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<212> DNA

<213> Homo sapiens

<400> 43

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cagtataaaa cggaagcagc ctctcgatat aacctgacga tctcagacgt cagcgtgagt      180
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taccatccta tgagcgagta cccacacctac cacacccatg ggcgctatgt gccccctagc      420
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cctgtttggg ctggtgagct gggagttcag gtgggctgct cacagcctcc ttcagaggcc      660
ccaccaatth ctcggaactt tctcagtgtg tggaagctca tgtgggcccc tgaggetcat      720
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<210> 44

<211> 1132

<212> DNA

<213> Homo sapiens

<400> 44

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gtggtggtac aattgactct ggocctccga gaaggtacca tcaatgtcca cgacgtggag      420
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tggggcatcg cgctgtgtgt gctgggtctgt gttctggttg cgctggccat tgtctatctc      600
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<210> 45
 <211> 717
 <212> DNA
 <213> Homo sapiens

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 <211> 2487
 <212> DNA
 <213> Homo sapiens

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| ccccgggctc caccgcccc ccagcccacg gtgtcacctc ggccccggac accaggccgg | 300 |
| ccccgggctc caccgcccc ccagcccacg gtgtcacctc ggccccggac accaggccgg | 360 |
| ccccgggctc caccgcccc ccagcccacg gtgtcacctc ggccccggac accaggccgg | 420 |
| ccccgggctc caccgcccc ccagcccacg gtgtcacctc ggccccggac accaggccgg | 480 |
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| ccccgggctc caccgcccc ccagcccacg gtgtcacctc ggccccggac accaggccgg | 900 |
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| ccccgggctc caccgcccc ccagcccacg gtgtcacctc ggccccggac accaggccgg | 1200 |
| ccccgggctc caccgcccc ccagcccatg gtgtcacctc ggccccggac aacaggcccg | 1260 |
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| aagcagcctc tcgatataac ctgacgatct cagacgtcag cgtgagtgat gtgccatttc | 1860 |
| ctttctctgc ccagtctggg gctgggggtgc caggctgggg catcgcgctg ctggtgctgg | 1920 |
| tctgtgttct ggttgcgctg gccattgtct atctcattgc cttggctgtc tgtcagtgcc | 1980 |
| gccgaaagaa ctacgggcag ctggacatct ttccagcccg ggatacctac catcctatga | 2040 |

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 <211> 19
 <212> PRT
 <213> Homo sapiens

<400> 47

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Val Leu Thr

<210> 48
 <211> 4003
 <212> DNA
 <213> Homo sapiens

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| ccggacacca | ggccggcccc | gggctccacc | gcccccccag | cccacggtgt | cacctcggcc | 840 |
| ccggacacca | ggccggcccc | gggctccacc | gcccccccag | cccacggtgt | cacctcggcc | 900 |
| ccggacacca | ggccggcccc | gggctccacc | gcccccccag | cccacggtgt | cacctcggcc | 960 |
| ccggacacca | ggccggcccc | gggctccacc | gcccccccag | cccacggtgt | cacctcggcc | 1020 |
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<211> 28

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<213> Artificial Sequence

<220>

<223> PCR Primer

<400> 49

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<210> 50
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<223> PCR Primer

<400> 50
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39

<210> 57
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<220>

<223> PCR Primer

<400> 57
gagcttgcat gaccagaacc tgtaacaact gt

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<210> 58
<211> 23
<212> PRT
<213> Homo sapiens

<400> 58

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Val Leu Thr Val Val Thr Ala
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<210> 59
<211> 24
<212> PRT

<213> Homo sapiens

<400> 59

Met Thr Pro Gly Thr Gln Ser Pro Phe Phe Leu Leu Leu Leu Leu Thr
1 5 10 15

Val Leu Thr Val Val Thr Ala Gly
20

<210> 60

<211> 50

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic Peptide

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Glu Ala Ala Ser Pro Tyr Asn Leu Thr Ile Ser Asp Val Ser Val Ser
20 25 30

Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala His His His His
35 40 45

His His
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<210> 61

<211> 63

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 61

Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile Asn
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Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr Glu Ala Ala
20 25 30

Ser Pro Tyr Asn Leu Thr Ile Ser Asp Val Ser Val Ser Asp Val Pro
35 40 45

Phe Pro Phe Ser Ala Gln Ser Gly Ala His His His His His His
50 55 60

<210> 62

<211> 19

<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 62

His His His His His His Ser Val Val Val Gln Leu Thr Leu Ala Phe
1 5 10 15

Arg Glu Gly

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<213> Homo sapiens

<400> 63

Thr Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr
1 5 10 15

Glu Ala Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser Val Ser
20 25 30

Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala
35 40

<210> 64
<211> 44
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 64

Thr Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr
1 5 10 15

Glu Ala Ala Ser Pro Tyr Asn Leu Thr Ile Ser Asp Val Ser Val Ser
20 25 30

Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala
35 40

<210> 65
<211> 13
<212> PRT
<213> Homo sapiens

<400> 65

Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu Gly
1 5 10

<210> 66

<211> 57

<212> PRT

<213> Homo sapiens

<400> 66

Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile Asn
1 5 10 15

Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr Glu Ala Ala
20 25 30

Ser Pro Tyr Asn Leu Thr Ile Ser Asp Val Ser Val Ser Asp Val Pro
35 40 45

Phe Pro Phe Ser Ala Gln Ser Gly Ala
50 55